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2,698,483

INTERSPATIAL DENTAL TOOTH CLAMP

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Application January 12, 1953, Serial No. 330,693

4 Claims. (Cl. 32—63)

This invention relates generally to clamps used by dentists, but more specifically to an interspatial or interproximal dental tooth-clamp of the hinged jaw type which is adapted to maintain a pressure and tooth contacting band looped around one interproximal spacing and secured at the next interproximal spacing of front or anterior teeth.

This type of clamp is especially useful in connection with the filling of front or anterior teeth wherein the tooth surface bearing the fresh filling either on the edge or face requires either shape conformation, application of pressure or various degrees of temperuare for curing the filling material. The band mentioned may be of any flexible material such as plastic and capable of maintaining an induced tension and surface contact.

The main feature of the clamp resides in the provision of a pair of hinged jaws, one jaw of which is provided with a self shape-adjusting jaw segment to conform to normal variations in the curvature of teeth adjacent interproximal spacings.

A further object of the invention resides in the provision of a tooth clamp of the character described having an offset pair of lever arms normally urged in opposite directions to maintain closure of the jaws, the offsetting of the lever arm permitting the clamp to maintain itself on the patient without discomfort and without contacting the lips or nose of the patient while his or her mouth is open.

A further object of the invention resides in the provision of a dental clamp which is useful for various techniques in dental work wherein it becomes necessary to maintain a flexible band in surface and pressure contact with front or anterior teeth for purposes of shaping and applying to the tooth at the same or consecutive periods temperature changes for curing tooth contained material such as fillings and the like.

A further object of the invention resides in the provision of a clamp which is light in weight, which requires a minimum amount of manipulation in application and which is capable of speedy and accurate use.

These objects and other incidental ends and advantages of the invention will hereinafter appear in the progress of the disclosure and as pointed out in the appended claims.

Accompanying this specification is a drawing showing a preferred form of the clamp wherein:

Figure 1 is a view in perspective of the clamp in forced open position.

Figure 2 is a view in perspective of the clamp shown in Figure 1 as applied to the anterior teeth of a patient shown in phantom lines.

Figure 3 is an enlarged view in perspective showing the clamp holding a band or matrix in surface and pressure contact with a front tooth filling at an interproximal spacing.

Figure 4 is an enlarged sectional view of Figure 3 across the plane 4—4 intended to show surface contact between the clamp jaws and the teeth at an interproximal spacing.

Figure 5 is a sectional view on a reduced scale of Figure 3 across the plane 5—5 showing the clamping action of the clamp jaws at an interproximal spacing of the free ends of a matrix or band under tension, said band closely hugging the involved tooth.

In accordance with the invention and the preferred forms shown, the dental clamp is comprised of a pair of lever arms 10 and 11 oppositely curved and joined

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together at a pivot 12. Each of the arms 10 and 11 are normally urged oppositely by spring means such as curved leaf spring 13 which at the front end is suitably secured to one of the lever arms such as 11 by rivets 14.

The lever arms 10 and 11 are conventional such as are used by physicians and dentists on forceps types of instruments, the spring urge of 13 being limited to pressures suited for the purposes herein.

Lever arm 10 is provided with an offset curved jaw arm 15 having an inner facing 16 terminating in a gripping surface 17. Gripping surface 17 is concavely curved along both axes and is sufficiently narrow to fit an interproximal spacing of the front and anterior teeth on one of the surfaces thereof. Facing 17 is furthermore angularly cut at the lower end to permit freedom of jaw arm movement and joins lever arm 10 at curved portion 19.

At the juncture of lever arm 10 and jaw arm 15 are a pair of ears 20 and 21 to receive the inner end of a jaw arm 22 secured to lever arm 11, the portion of jaw arm 22 between ears 20 and 21 being indicated by a lug portion 22a. The pivot pin 12 secures the jaw arms together.

At the end of jaw arm 22 is a jaw segment 23 having a gripping surface 24 which is oppositely curved along both axes relative to the gripping surface 17 and corresponds thereto in size so that both gripping surfaces 17 and 24 extend from the incisal tip to the gingival edge of the front or anterior teeth. As shown in Figure 1, the gripping surfaces 17 and 24 are roughened or ridged.

The jaw segment 23 is freely movable about the end of jaw arm 22 by means of a pivot 23a penetrating jaw ears 25 and 26 and the end of jaw arm 22 therebetween.

Spring 13 normally causes lever arms 10 and 11 to diverge causing the jaw gripping surfaces 17 and 24 to approach each other toward engagement. The segmental jaw member 23 is preferably adapted to be on the inner side of the involved teeth and automatically conforms to the curvature of adjacent teeth at an interproximal spacing, while jaw 15 engages the opposite and corresponding front side of the teeth.

The jaw gripping surfaces 17 and 24 are adapted to engage a matrix or a band looped around the affected tooth. Thus, tooth 27 has an interproximal spacing 28 with tooth 29 and tooth 30 has an interproximal spacing 31 with tooth 27. The band or matrix 32 is looped around a filling or treating substance 33 on tooth 27, the band having free ends 34 and 35.

Matrix 32, made of suitable and flexible material to exert pressure, make surface contact with the tooth affected and serve as a fluid-proof conductor of heat or cold is looped around spacing 28 and over repair area 33. The free ends 34 and 35 are put under proper tension by pulling and are clamped in the tensioned position at interproximal spacing 31 by pressing lever arms 10 and 11 until proper engagement takes place. Thereafter, the arms 10 and 11 are released and the clamp remains in position for the purposes described.

The width of the jaw gripping surfaces 17 and 24 may be varied and need not be roughened or corrugated for frictional purposes with respect to matrix 32. The general shape and contour of the lever and jaw arms together with the sizes and shapes of the jaw gripping surfaces may also be varied.

I wish it understood that the material from which the clamp is made is conventional such as various types of steel, and that minor changes and variations in the material, location, integration, and connection of parts may all be resorted to without departing from the spirit of the invention and the scope of the appended claims.

I claim:

1. In a dental clamp for the interproximal spacing between teeth, a pair of lever arms hinged at one end, a spring between said lever arms to cause a divergence thereof, opposing and vertically offset jaw arms extending from said lever arms, one of said jaw arms having a curved gripping face, the other of said jaw arms having a jaw segment freely hinged thereon and provided with a corresponding and an oppositely curved gripping face.

2. In a dental clamp for the interproximal spacing